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CERTIFICATE

This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 28 April 2003 with an application for Letters Patent number 525525 made by FRESH APPEAL LIMITED.

Dated 29 April 2004.

Neville Harris

Neville Harris
Commissioner of Patents, Trade Marks and Designs

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NEW ZEALAND
PATENTS ACT 1953

PROVISIONAL SPECIFICATION

"Material Immersion Apparatus"

We, **FRESH APPEAL LIMITED**, a company duly incorporated under the laws of New Zealand of 227 Jericho Road, Pukekohe, New Zealand, do hereby declare this invention to be described in the following statement:

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The present invention relates to apparatus, methods, uses and products capable of providing a liquid dipping process for material or material(s) ("material(s)"). More particularly although not solely the invention utilises an inverted flighted endless conveyor to lower and uplift the material(s) and to hold the material(s), if buoyant with respect to the liquid, to force the material(s) under the liquid prior to uplifting the material(s) therefrom.

Rotary paddled systems have hitherto been utilised in a bath, the wall of which assumes a form similar to that of the locus of the distal part of the paddles of the rotary wheel.

The present invention appreciates however that such paddle wheel systems provide a transitory immersion only where by necessity (where there is to be both a gravity assisted loading zone and a gravity assisted discharge zone from the paddle wheel) there is a keeping of the liquid level below the rotational axis.

The present invention recognises a significant advantage can arise from the use of a flighted endless conveyor in that it has the prospect of providing a longer dwell time in liquid without reliance on a greater volume of liquid over that which might be used in a paddled wheel immersion system. Moreover the present invention recognises an advantage can occur at the discharge zone from such a conveyor when inverted owing to the prospect that such an endless conveyor can provide a discharge zone which is more positive in allowing the falling of already immersed materials therefrom.

It is therefore an object of the present invention to provide apparatus, methods, uses, etc. which will at least go some way to take one or more advantage from the use of a flighted endless conveyor for the purpose of material immersion in a liquid.

As used herein the term "liquid" includes any fluid which has a liquid component, i.e.; it can include mixtures of liquids, solutions, suspensions, emulsions, suspo-emulsions, etc.

In one aspect the invention consists in **apparatus for immersing material or materials ("material(s)") in a bath**, said material(s) being preferably buoyant with respect to liquid of the bath, said apparatus comprising or including

a bath containing or to contain said liquid,

a flighted endless conveyor that serially present flights to a loading zone where each flight serially flight receives thereon material(s) to be immersed in the liquid of the bath and later presents material(s) initially received by the preceding flight to a discharge zone from whence the material(s) leave the flight,

wherein the loading zone to discharge zone involves an initial flight supported lowering of the materials and thereafter a following flight uplifting of the material(s) and/or liquid in

the bath until such time as the materials are supported by said following flight out of the liquid of the bath and carried at least in part thereby to the discharge zone.

Preferably the discharge zone involves a gravity supported cascading of the materials from said following flight.

Preferably the locus of movement of the endless conveyor is that of an inverted conveyor preferably substantially in the form of an inverted "j", the loading zone being at a region beyond the crook of the inverted "j" down which the flights move substantially on a vertical locus prior to ascending on the opposite side of the stem of the "j" and then into the overhang zone of the inverted "j" at which there is the discharge zone.

Preferably in other forms banana or other type circuit type shapes are contemplated irrespective of whether or not there is a vertical or near vertical descending from the loading zone, irrespective of whether or not there is a vertical or near vertical ascending from the lower most zone and irrespective of whether or not there is any overhand (and irrespective of any concavity or not in the locus).

In yet a further aspect the present invention consists **in the use of an inverted flighted endless conveyor** for the purpose of immersing materials in a bath, e.g.; of a dipping liquid.

By way of example only such immersion can be of apple pieces, e.g.; during a process as in PCT/NZ02/00168.

Preferably the bath conforms at least in part to those regions of the conveyor that are to low the materials to carry the materials through and uplift the materials from the liquid.

In yet a further aspect the present invention consists **in the use of apparatus** of any of the kinds in accordance with the present invention for the purpose of dipping vegetable and/or fruit material in an appropriate dipping solution.

In still a further aspect the present invention consists **in dipping apparatus** substantially as herein described with reference to any one or more of accompanying drawings.

In yet a further aspect the present invention consists **in a method of dipping materials** when performed substantially as herein described with reference to any one or more of the accompanying drawings or the description generally.

In yet a further aspect the present invention consists **in a method of treating vegetable and/or fruit materials** which comprises or includes immersing the materials in a treating liquid under the action of a flighted endless belt conveyor.

The invention also consists **in materials** treated by a method or apparatus of the present invention.

This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

A preferred form of the present invention will now be described with reference to the accompanying drawing in which,

Figure 1 is a side view of an inverted (an inverted J shaped locus) and flighted endless belt conveyor having an infeed loading zone for materials (such as apple slices) and having a discharge zone which under gravity drops the materials into a like or, as shown, a conventional paddle wheel type immersion apparatus for a secondary immersion process, and

Figure 2 is a perspective diagram shown with the bath containment transparent (for ease of explanation) showing the inter-relationship of the components.

In the preferred form of the present invention a bath 1 defined by liquid in the lower part of a generally inverted "j" or banana shaped containment (both inner and outer walls) has descending there into a series of flights 3A, 3B, etc. carried by a motor/gearbox driven endless belt conveyor such that apple slices, onion slices or other materials may be fed into the encompassment of the bath 1 but above the liquid level shown as 5 so as to be supported on a flight 3A (on one side) prior to that moving downwardly below the liquid thereby floating the apple pieces on the liquid until such time as the following flight 3B (by its side facing flight 3A) forces the materials downwardly around the bottom 4 of the bath before uplifting the materials with the flight 3B to the discharge zone 6 from whence the immersed materials cascade into any subsequent collection or subsequent treatment apparatus.

The flights (e.g.; 3A, 3B et al.) are preferably perforated slats to ensure the immersed product can freely drain back to the bath prior to discharge.

As shown, by example, is a paddle wheel arrangement 7 for a subsequent treatment solution.

A process that might be utilised is an apple or other treatment regime substantially as disclosed in the aforementioned Patent Specification of HortResearch or which may be a treatment regime such as disclosed by various Mantrose Haueser Company patent (e.g.; US 5,925,395 and 5,939,117).

As shown in the drawings an infeed conveyor 8 is provided to feed to the loading zone 9 between flights whilst the liquid level of the liquid 5 in the inverted 'j' shaped bath (both that

shape for the inner and the outer walls so as to provide a better guide for the belt) is maintained reliant upon a dosage tank 10 feeding through a heat exchanger 11 communicating by a pump system 12 with the bath 1. As separate liquid can be provided in any subsequent treatment apparatus such as the paddle arrangement shown in 7.

Persons skilled in the art will appreciate the speed control applicable (dependent on treatment needs) for the motor/gearbox 12 (e.g.; providing variable speed drive to allow different immersion times) and for relativity with any previous and following processing the variations that exist for arrangements as aforesaid.

DATED THIS 28th DAY OF April 2003
AJ PARK
PER *J. Finlay*
AGENTS FOR THE APPLICANT

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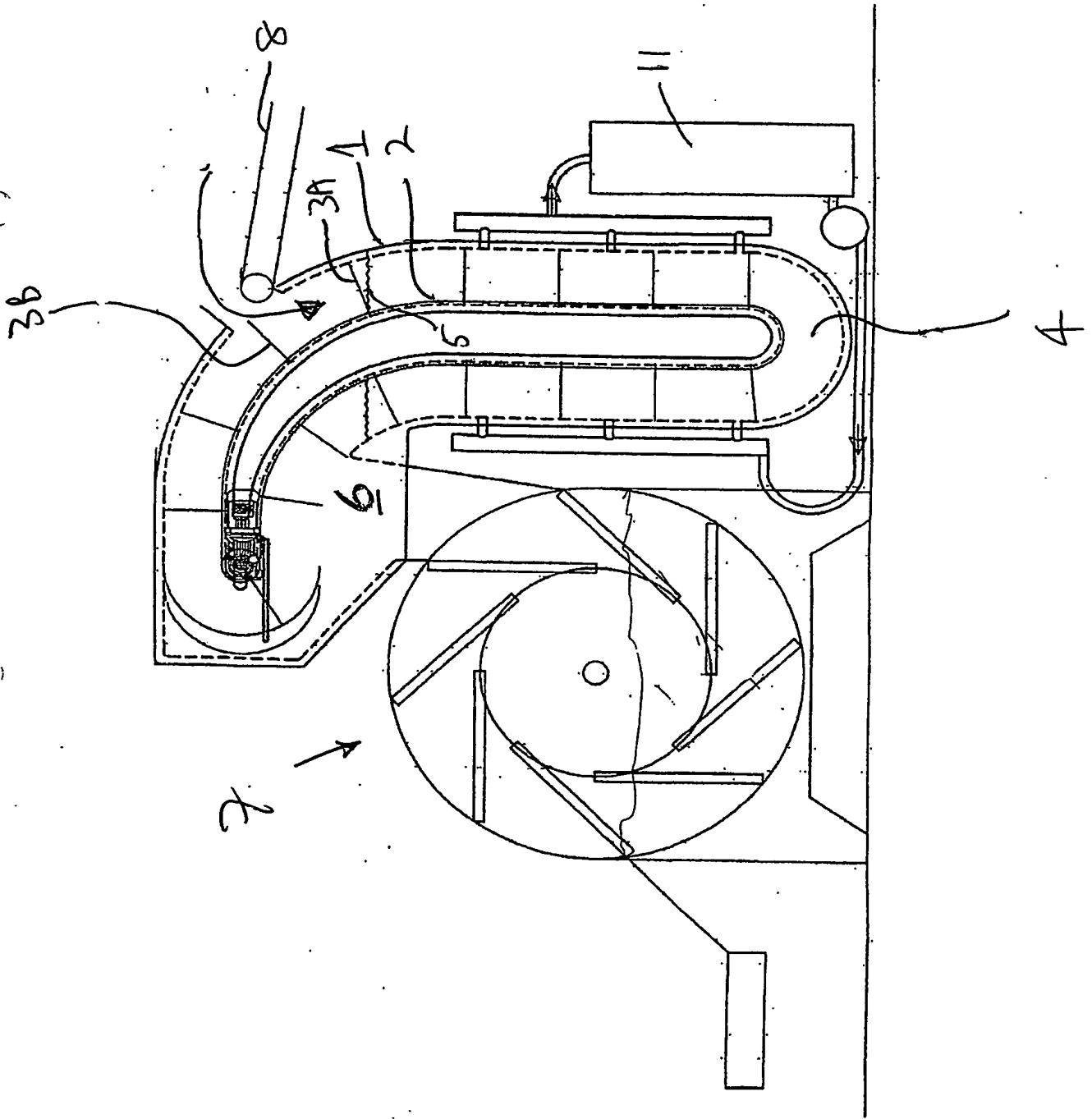
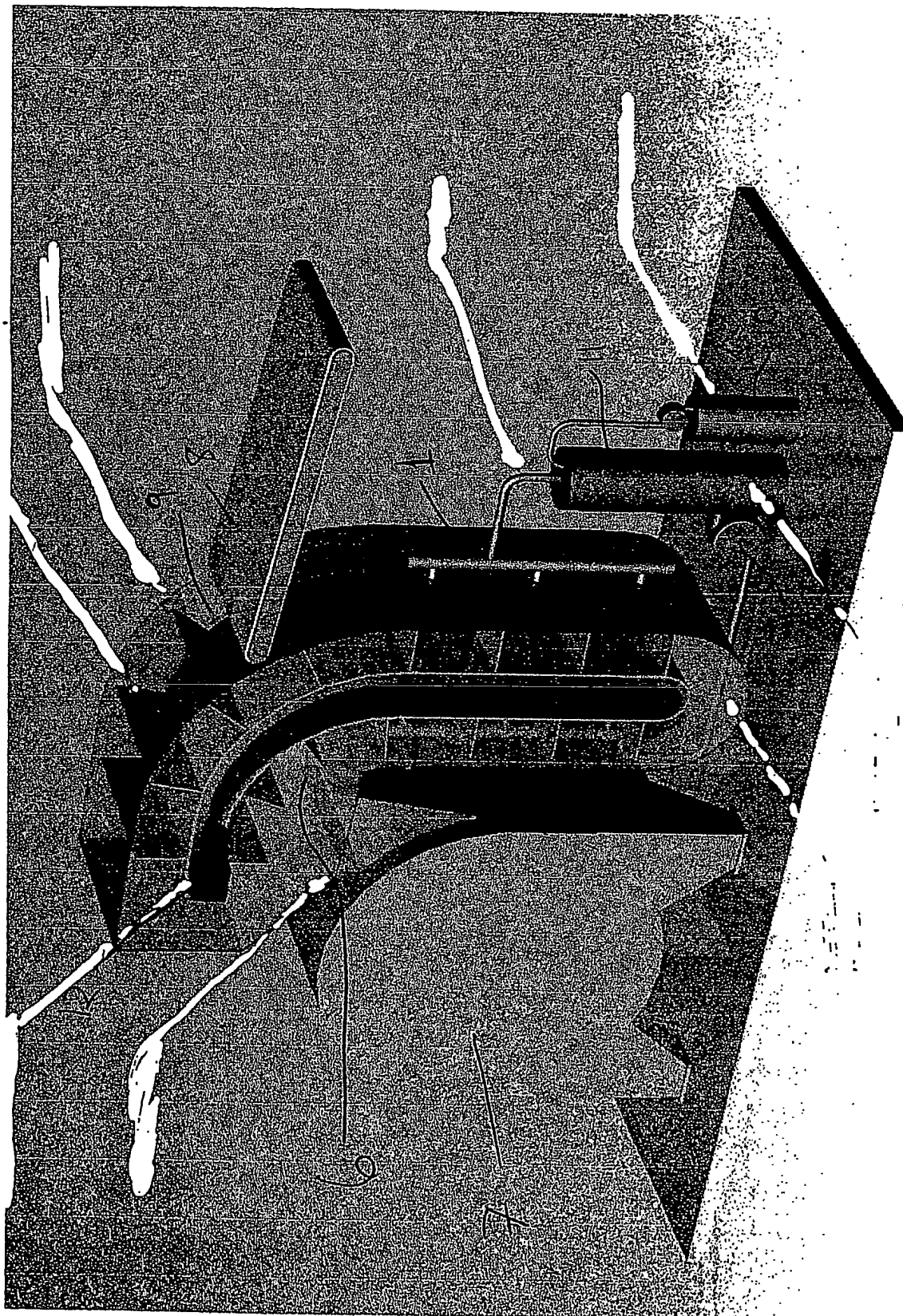


Fig 1



Flg2.

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